

**Amendments to the Claims:**

The listing of claims below will replace all prior versions and listings of claims in the application. The changes to currently amended claims are shown using strikethrough to identify deleted material and underlining to identify added material.

**Listing of Claims:**

1. (currently amended) A method for beneficiation of a mineral sulfide-containing material by air-injection froth flotation in the presence of a collector, the method comprising:

- a) providing an aqueous slurry of the mineral sulfide-containing material;
- b) adding a selective collector to the slurry in an amount less than about 100 g/ton of the mineral sulfide-containing material, the collector comprising:

~~at least one oil that contains no sulfur, nitrogen or phosphorous,~~  
wherein the oil is selected from the group consisting of:

- 1) a natural oil or synthesized oil comprising:
  - A) triglycerides containing fatty acids of only 20 carbons or less, or
  - B) an ester made from a fatty acid and an alcohol; and
- 2) an essential oil; and

a sulfur-containing sulfide mineral flotation promoter selected from the group consisting of xanthates, thionocarbamates, dithiophosphates, mercaptans, and combinations thereof.

- c) selectively floating the mineral sulfide by injecting air and selectively allowing the mineral sulfides to adhere to the air bubbles; and
- d) recovering the mineral.

2. (previously amended) The method according to claim 1, wherein said mineral sulfide-containing material is selected from the group consisting of chalcocite, chalcopyrite, bornite, galena, sphalerite, pentlandite, molybdenite, and other sulfide

minerals containing silver, gold, platinum, palladium, iridium, rhodium, or osmium, either in the crystal structure or in association as an independent mineral species, and combinations thereof.

3. (original) The method according to claim 1, wherein said mineral sulfide-containing material is derived from ores, concentrates, precipitates, residues, tailings, slags, or wastes.

4. (currently amended) The method according to claim 1, wherein the essential oil comprises a compound selected from the group consisting of at least one of a terpene compound, and an aromatic compound, and a combination thereof.

5. (previously amended) The method according to claim 1, wherein the essential oil comprises a terpene derivative having a functional group selected from the group consisting of an alcohol, an ether, an aldehyde, and a ketone.

6. (previously amended) The method according to claim 1, wherein said triglyceride further comprises at least one functional group selected from the group consisting of ketones, aldehydes, ethers, and alcohols.

7. (original) The method according to claim 1, wherein the natural oil or the synthesized oil further comprises an aromatic functional group.

8. (canceled)

9. (currently amended) The method according to claim ~~8~~ 1, wherein said oil and said sulfur-containing sulfide mineral flotation promoter are emulsified.

10. (canceled)

11. (currently amended) The method according to claim 8 1, wherein said collector further comprises a frother.

12. (original) The method according to claim 1, wherein said collector further comprises a frother.

13. (previously amended) The method according to claim 1, wherein said collector further comprises a petroleum-based flotation promoter.

14. (original) The method according to claim 1, wherein the natural oil is selected from the group consisting of cottonseed, corn, linseed, rice bran, safflower, soybean, avocado, jojoba, menhaden, lard, castor, cod liver, tung, oiticicia, apricot, sunflower, pistachio, herring, and coconut; and the essential oil is selected from the group consisting of limonene, citronella, eugenol, eucalyptus globus, camphor, and clove oil.

15. (original) The method according to claim 1, wherein said natural oil is selected from the group consisting of cottonseed, corn, linseed, rice bran, safflower, soybean, avocado, jojoba, menhaden, lard, castor, cod liver, tung, and oiticicia; said synthetic oil is 2-butyloctyl oleic acid ester; and said essential oil is selected from the group consisting of limonene, citronella, eugenol, eucalyptus globus, camphor, and clove oil.

16. (original) The method according to claim 1, wherein the collector comprises a natural oil selected from the group consisting of: cottonseed, corn, linseed, rice bran, safflower, soybean, avocado, jojoba, menhaden, lard, and castor.

17. (original) The method according to claim 1, wherein the collector comprises a natural oil selected from the group consisting of: cottonseed, corn, linseed, rice bran, safflower, and soybean.

18. (original) The method according to claim 1, wherein the collector comprises cottonseed oil.

19. (original) The method according to claim 1, wherein the collector comprises an essential oil.

20. (original) The method according to claim 19, wherein the collector comprises limonene or citronella.

21. (original) The method according to claim 1, wherein the collector comprises a synthesized oil.

22. (original) The method according to claim 21, wherein the collector comprises 2-butyloctyl oleic acid ester.

23. (original) The method according to claim 1, wherein the collector comprises a blend of two or more of said natural oils, synthetic oils or essential oils.

24. (currently amended) A method for beneficiation of a metallic species of gold, silver, copper, palladium, platinum, iridium, osmium, rhodium or ruthenium by air-injection froth flotation in the presence of a collector, the method comprising:

a) providing an aqueous slurry of a material containing the metallic species, the material being derived from any ore, concentrate, residue, slag, or waste;

b) adding a selective collector to the slurry in an amount less than about 100 g per ton of material containing metallic species, the collector comprising:

~~at least one oil that contains no sulfur, nitrogen or phosphorous,~~  
wherein the oil is selected from the group consisting of:

1) a natural oil or synthesized oil comprising:

A) triglycerides containing fatty acids of only 20 carbons or less, or

B) an ester made from a fatty acid and an alcohol; and

- 2) an essential oil; and  
a sulfur-containing sulfide mineral flotation promoter selected from the group consisting of xanthates, thionocarbamates, dithiophosphates, mercaptans, and combinations thereof;
- c) selectively floating the metallic species by injecting air and selectively allowing the mineral sulfides to adhere to the air bubbles; and
- d) recovering the metallic species.
25. (canceled)
26. (canceled)
27. (canceled)
28. (canceled)
29. (canceled)
30. (canceled)
31. (canceled)
32. (previously presented) The method of claim 1 wherein the collector is added in an amount less than about 50 g/ton of material.
33. (previously presented) The method of claim 1 wherein the collector is added in an amount less than about 30 g/ton of material.
34. (previously presented) The method of claim 1 wherein the collector is added in an amount less than about 10 g/ton of material.

35. (previously amended) The method of claim 1, further comprising separating the floated mineral sulfide and subjecting the mineral sulfide to a second flotation by repeating (b) and (c).

### **SUPPORT FOR AMENDMENTS**

Dependent claims 8 and 10 have been canceled without prejudice to their continued prosecution in a continuation and/or divisional application.

Each of independent claims 1 and 24 has been rewritten to include the limitations of canceled dependent claims 8 and 10.

Dependent claim 4 has been clarified by the addition of a Markush-style recitation.

Dependent claims 9 and 11 have been rewritten to depend from independent claim 1 rather than from cancelled claim 8.

No new matter has been added.

Upon entry of this Response, claims 1-7, 9, 11-24, and 32-35 are present and active in the application with claims 4-6 and 19-23 being presently withdrawn as directed to non-elected species.